INFANTILE MORTALITY

A short account of Preventive Measures in six Yorkshire Towns:

A general discussion of its causes and best means of Prevention:

being a

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by

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I N D E X.

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INFANTILE MORTALITY.

The question of the high Infantile Death Rate and the best means of lowering it has occupied the public mind, or that section of it interested in social problems, very closely during the past few years. The National Conference which was held at Westminster in 1906 helped much to stir up interest in England on this subject: the Continental countries had already started preventive work; France especially had been faced with the evil of a low birth rate and had set to work to counteract this by an endeavour to lower the infantile death rate.

When one remembers, that less than half a century ago Malthus and Annie Besant were preaching against the evils of over-population, that the present problem is largely due to the readiness with which their doctrine was accepted, one realises the importance of moving slowly in big questions like these, of halting on each step to make as sure as possible that it is in the right direction, of pausing to survey the work done, to learn what is possible from experience before striking out on new paths.

In this paper it is proposed to give first a sketch of the work against infantile mortality in six Yorkshire towns, to be followed by a general discussion on the causes and the best means of prevention. The account of the work being done in Huddersfield will be most detailed, as the writer has been working there for the past year so has an intimate knowledge of facts and conditions; she has visited each of the other towns in order to specially enquire into the subject. The chief features of the work in each will be stated as briefly as possible.

The six towns are all in the West Riding; their climatic conditions are very similar; they all suffer from fogs and smoke, with a corresponding want of sunshine; the people are mostly of the same race and have similar customs of life. The first four towns have this in common, that the chief women's work is in textile factories, woollen, cotton or silk.

HUDDERSFIELD.

Vital Statistics[1] for 1906.

Population 1901 - 95,046: 1906 - 94,862.

Birth rate 24.34.

Death rate 17.33.

Infantile Mortality 135.

Density of the population, for the Borough, 8 persons per acre: for the Central District, 31.4 persons per acre.

In Huddersfield the work for the prevention of excessive infantile mortality may be divided into two parts, the Official and the Voluntary; the latter is also under the control of the Public Health Department. In 1905 Mr Benjamin Broadbent, Mayor of Huddersfield, promised to present a sovereign to every baby born in the Longwood District of the town during 1905 when it attained the age of one year, with the result that the infantile death rate figure for that district fell from 122 to 65. The same experiment is at present being tried by him in one of the poorest and most crowded parts of the town, but the results are not yet known.

The official part of the work is done by two women doctors, Assistant Medical Officers of Health,

under the supervision of the Medical Officer of Health. By means of a special Bill for Huddersfield, which came into force in November 1906, all births must be notified at the Public Health Office within 48 hours. As soon after notification as possible, usually within three days, the house is visited by one of the doctors, the mother is seen if she is willing, the baby weighed, and the mother encouraged to breast-feed; if no doctor is in attendance advice is given as to feeding, sleeping and cleanliness: special attention is paid to the baby's eyes, and if desirable the mother is recommended to have a doctor. This visit also offers an excellent opportunity to see the work of the midwife, mistakes or negligence noted, about which she can be warned and counselled at a suitable time. The doctor revisits the baby if she considers it necessary, but as a rule it is passed on to the voluntary visitor.

The Voluntary Association, called the Huddersfield Public Health Union, was formed in 1905; Mr Broadbent is President; the Members are mostly ladies residing in Huddersfield, willing to undertake a certain amount of work.

The town is divided into seventeen districts, Each of these has a Lady Superintendent and Helpers,

the number of the latter varying with the need of the particular locality, and with the help available. Each Lady Superintendent receives every Wednesday a list of the babies born in her District during the past week; she apportions these to her Helpers, who are responsible to her for the work they do. A committee meeting of the Women Doctors and the Lady Superintendents is held once a month. This helps to bring the official and voluntary workers into closer touch, and gives an opportunity of discussing special cases, any difficulties that may have arisen, and new methods. It is always difficult to get regular and systematic work from a voluntary body. The ideal aimed at is, that every baby should be visited once a month till a year old; special cases such as, where the baby is delicate, badly looked after, or an illegitimate child put out to nurse, oftener. Whenever the visitor is not satisfied, she is expected to report the case immediately to the Public Health Office, and one of the doctors will then visit it. The voluntary workers are specially asked to report any case where the mother thinks of changing from breast feeding to bottle, or where the baby is to be weaned. These are critical periods in an infant's life when advice might be

given - and sometimes taken. It has also been agreed, taking into consideration the difficulty of getting regular reports, that when an infant attains one year its visitor should send in a short resumé of its history. The scheme has not been working long enough to justify building too much on the statistics at present available, but the fact that the infantile death rate for 1907 is only 97 per 1000 births, which is 22 per 1000 births less than any previous year, is very encouraging, even after making due allowance for the cool summer with the resulting freedom from epidemic diarrhoea which should of itself lower the mortality. What one would lay more stress on are the little things, the straws which show how the wind blows, the general impression one gets in going about among the people, in talking to them and observing them, these are not proofs which would have much weight in a court of justice, but they hold seeds of hope very cheering to the workers. The midwives say that in many cases the mothers have improved; they do not like the "lady doctor" to come and find the baby not properly looked after. Many mothers have been persuaded to abandon the tube-bottle, and to regard the dummy teat as a curse instead of a blessing; one

visitor reports that in her district, one of the worst, the wives say their husbands treat them better since the ladies began to visit. These are all trifles, but they all help to raise the general tone and to educate public opinion which is the most powerful factor for good or for evil.

In Huddersfield the majority of the mothers suckle their children; of 875 babies, 755 were being breast fed at the first visit, 32 were on the bottle, and 88 were doubtful. This last means that at the time of the visit the milk flow was not established, but the mother wished to breast feed - in per centages, 86.3 breast fed, 3.7 bottle, and 10. doubtful. There are, as yet, no full statistics of these babies later, but in November 1907 of 900 babies being then visited by the voluntary workers, 78 per cent were being breast fed. The common story is that when the mother gets up and begins her usual house work the milk leaves, or decreases so much that the child must be given an occasional bottle. This is usually fatal, as it is only the exceptional mother who perseveres with mixed feeding. In a few cases where the mother was really anxious to feed the child, the milk flow has been found to increase again, and the baby once more becomes completely

breast fed. An important feature of the work in Huddersfield is that the women doctors also supervise the midwives. If the problem of Infantile Mortality is to be solved, it must be realised what a power these women have either for good or evil. First, as regards the care of the mother during and after parturition, a child is more likely to be carefully tended if the mother is strong and healthy; her milk will also be better. Secondly, if the midwife is keen on babies being breast fed she can usually persuade her patient of its advantage. Lastly, if she learns to regard the doctor as one who wishes to help her and to whom she can go for help and advice, much may gradually be done in teaching her the importance of thorough cleanliness both of herself and of her patient; of the care of the baby's eyes; the dangers of improper food; and many other details of the hygiene of infancy. As every baby is visited about three days after birth, and in midwives cases if there are any suspicious symptoms pulse and temperature are taken, few cases of Puerperal fever can escape detection; the midwife can be suspended at once and thus prevented from carrying infection.

The majority of the mothers do not go out to work. Those who do are generally obliged to do so;

the husband is out of work, delicate, lazy, drunken or an unskilled labourer whose earnings at the best are small and very irregular. Only two women out of 1000 said they preferred to work in the factory to staying at home; whether fewer married women work now than three years ago it is impossible to say. The married women are very often rug weavers. In this branch the demand for workers is greater than the supply; no steam power is used; the worker can come and go when she likes, so that a mother can continue to suckle her child if she live near the workroom. A quick woman can make a fair wage. A few earn £1 per week, but it is dirty work, and is said to attract a lower class of women and girls.

The milk supply is on the whole fairly good, and as most of the mothers breast feed, there is no nesessity for a milk depot; it would probably do more harm than good, as it might encourage the use of bottles. It is a common saying among the poorer and most incapable women "I would rather suckle the baby; it's much less trouble." When the mother is suffering from want of proper nourishment an arrangement has been made with an already existing charity "The Invalids' Kitchen", by means of which she is supplied with tickets for sago and milk, beef-tea or soup. The Huddersfield scheme is an admirable

one and well suited to the town. This last fact is most important. The conditions of a town should be studied and the scheme gradually varied to suit its special requirements.

Huddersfield might be said to consist of a number of villages, whose inhabitants resemble those of rural districts, one family often residing in the same cottage for several generations, joined to a central urban district containing the slum area with its constantly moving population. There is some overcrowding, and the housing leaves much to be desired; land is leasehold and expensive; even the new houses are built back-to-back.

Many of the Lady Superintendents and Lady Visitors were eminently suited for the work. They were well known to the poorer class and had visited a great deal among them before undertaking this special work. It is quite possible in other towns the work would be done better by paid Health Visitors - both sorts have their advantages and disadvantages. One special feature of the Huddersfield scheme is that there every baby is visited by a fully qualified woman whose training should enable her to take a broad outlook on the work, to study the different aspects of the problem scientifically as they present

themselves, to collect facts carefully and draw conclusions slowly, and perhaps in the end be enabled to throw a little light on much that still remains dark.

BRADFORD.

Vital Statistics[2] for 1906.

Population 1901 - 279,767: 1906 - 288,544.

Birth rate 20.58.

Death rate 16.

Infantile Mortality 152.

The preventive work in Bradford is carried on under the Medical Officer of Health by a Head Woman Sanitary Inspector with two Assistants. In the year 1907 one of the poorest districts (North Ward), with a population of 12,963, was selected to be worked. Post-cards, stamped and addressed, were sent to all the midwives in the district who were asked to notify every birth attended by them as soon as possible to the Public Health Office. The response to this appeal was most satisfactory. The remaining births were obtained from the Registrar's list. This might mean a delay of six weeks.

The babies were visited at least once a month, oftener if deemed necessary. Seventy-five per cent of the mothers are said to breast feed; they are good mothers, mostly of Irish extraction in this district; the majority of them go out to work, but

they usually stay at home for three or four months after child-birth. In many cases when they return to work they continue to suckle the baby, who apparently flourishes in spite of the long intervals between feeds.

Bradford had a milk depot with Pasteurised and Humanised milk. This has been given up; the present plan is to have farms under strict inspection, build a municipal dairy, cool and bottle the milk; also to supply Humanised milk on a doctor's prescription. The ordinary milk supply of Bradford is said to be bad.

There is a great deal of drinking among the women; abortion and premature labour are believed to be frequently induced, also a free use of preventatives to conception. The average man's wage is low, wool-combers earning only 19/- a week, and unskilled labourers 21/-.

HALIFAX.

Vital Statistics[3].

Population 1901 - 104,936: 1906 - 108,000.

Birth rate 19.4.

Death rate 15.5.

Infantile Mortality 116.9.

No special work against Infantile Mortality was being done here in 1907. Lectures to mothers were given by the Medical Officer of Health, and pamphlets drawn up by him distributed by the Registrar.

The town is a healthy one, well-paved, no new houses are allowed to be built back to back, and what are called the slums seemed in very fair repair. The supply of houses evidently exceeds the demand, as there were about a thousand unlet; rents are lower than in Huddersfield, most of the property being freehold not leasehold; rates are high - over 9/- in the £. Married women's work is discouraged.

BRIGHOUSE.

Vital Statistics[4] for 1906.

Population 1901 - 21,735: 1906 - 22,196.

Birth rate 20.72.

Death rate (corrected) 14.5.

Infantile Mortality 141.

There is no special preventive work being done here. The Infantile Mortality figure for 1906 was an unusually high one: in 1905 it was 111, and in 1904, 106. There was no special epidemic to explain the increase, no outbreak of summer diarrhoea: sixty-five infants died - nine from diseases of the respiratory system, which is not surprising to anyone who has lived through a winter in this district; the constant heavy cold, damp fogs must make it unsuited for the young with a proclivity to catarrh of the respiratory passages. There is much women's work, textile factories - silk, woollen, and cotton - but no details were obtainable as to whether many married women work.

LEEDS.

Vital Statistics[5] for 1906.

Population 1906 - 463,495.

Birth rate 25.4.

Death rate 16.03.

Infantile Mortality 152.

The Medical Officer of Health has a female staff consisting of a Head Inspector with six Assistants. These undertake all the branches of Public Health relating to women and children.

In one district where the infantile death rate is highest, every newly-born infant is visited, the names being obtained from the Registrar's list, with the consequent possible delay of six weeks. Bottle-fed babies are visited as regularly as possible for three or four months, after this only occasionally, unless a case calls for special care; breast-fed infants less frequently. All infantile deaths are inquired into. It has been found that the inspector can get more details in these cases. The results of these inquiries, when published, should help to throw some light on the various causes of the high mortality figure. The inspectors report some encouraging results; (fifty babies who were being only partly)

results; fifty babies who were being only partly breast-fed became entirely so, and in twenty-four cases tube-bottles were given up.

There is no milk depot at present in Leeds. One was run for two years by voluntary subscriptions. The results were believed to be encouraging: a full report is to be published shortly.

Many of the women work in woollen factories and as tailoresses in the wholesale clothing trade.

The morality of Leeds is low: abortion and premature labour are common.

SHEFFIELD.

Vital Statistics[6] for 1906.

Population 1906 - 447,951.

Birth rate 30.

Death rate 16.7.

Infantile Mortality 156.

In Sheffield the work against Infantile Mortality is being more fully organised. The Early Notification of Births Act has been adopted. The Female Staff, which consisted in 1907 of a Head Inspector and ten Assistants, is to be increased to fourteen. The town is to be divided into twelve districts. Every baby is to be visited as soon after birth as possible and suitable cases revisited.

Lectures on the "Care of Children" and other relevant subjects are given at Mothers' Meetings. The milk supply of Sheffield is bad; a "Dried Milk" Depot has been started, at which in December 1907 280 babies were attending, the results being very gratifying.

Many of the mothers work at home at file-cutting, earning about six shillings a week. The homes of these women are as a rule well kept. Women and

girls also work at Jam and Sweet Factories, but not so many married women.

Immoral practices are common, lead being largely used as an abortifacient.

GENERAL DISCUSSION OF THE VARIOUS CAUSES WHICH LEAD TO EXCESSIVE INFANTILE MORTALITY.

The foregoing resume of the preventive work being done in six Yorkshire towns is too restricted, and the inquiries made too limited to justify the drawing of any definite conclusions directly from these. All that is possible is to discuss the various causes of Infantile Mortality, and what means might be made use of to reduce its rate, exemplifying one's statements by the statistics of these six towns.

If a Table of Causes of Death under one year is studied, it will be found they may be classified as follows:-

Premature Births
Congenital Defects
Marasmus, Debility and Atrophy
Convulsions
Systemic Diseases
Infectious Diseases
Traumatism.

These might be divided into two groups, Ante-natal and Post-natal, i.e.

Ante-natal	Premature Births Congenital Defects Marasmus, Debility and Atrophy. Convulsions
Post-natal	Systemic Diseases Infectious Diseases Traumatism

Convulsions have a place in both groups, as in all probability convulsions which end fatally during the early months of infant life are due, or more exactly, the fatal termination is due, to some pre-natal cause.

These causes must now be considered in detail.

If the Ante-natal group be first considered, the study of the following comparative Table of the number of infant deaths from these causes in the six towns during 1906 may be interesting :

	Premature Births	Congenital Defects	Marasmus Atrophy Debility	Total Number	Per Centage of total Infantile deaths
Huddersfield	38	11	26	75	24
Bradford	142		128	270	30
Halifax	39	14	36	89	37
Brighouse	7	1	9	17	26
Leeds	239	72	192	503	27.5
Sheffield	284	166	211	561	26

If to these be added the deaths under three months from convulsions, the percentages of total infantile deaths due to ante-natal conditions would be:-

Huddersfield	29	per	cent
Bradford	35	"	"
Halifax	43	"	"
Brighouse	30	"	"
Leeds	31	"	"
Sheffield	32	"	"

As the number of deaths from post-natal causes decrease, the percentage of those from ante-natal ones will increase, and the importance of trying to influence these will be more fully recognised. In the foregoing comparative table Halifax, with the lowest Infantile Mortality figure of the six towns under consideration, i.e. 116.9, has the highest percentage (43) of deaths in the ante-natal group; out of 212 infantile deaths in Huddersfield during 1907, 96 or over 45 per cent belong to this group. The infantile mortality figure (97) was exceptionally low.

"Birth is not the beginning of life for any one of us; we were all alive for some months biologically if not legally before we were born[7]," is a truism which emphasises the need of a fuller knowledge of ante-natal pathological conditions and the causes of them.

Medicine owes much to Ballantyne for his work on this subject, but there still remains an immense field for research.

Ballantyne[8] lays great weight on the importance to the foetus of a healthy placenta. What he says of the part played by it in foetal pathology may be summed up under the following four heads.

Firstly, the presence of the placenta makes it possible for the foetus to be diseased in structure to a very advanced degree without a suspension of its vitality.

Secondly, it may act as a barrier preventing sometimes the passage of poisons and toxins from a diseased maternal organism.

Thirdly and conversely it may also act as the avenue of access for germs.

Fourthly, pathological conditions of the placenta may be fatal to the life of the foetus. "The placenta is in this sense the most vital organ that the foetus possesses; but it is also the most vulnerable."

Only the third and fourth heads bear directly on the present matter. With regard to the third Ballantyne says[9] "there can be no doubt, therefore, that although its permeability varies, the placenta

is the avenue by which germs and poisons reach the foetus. This circumstance has a very considerable bearing upon the position of primary lesions in the foetus. The infection reaches the body of the unborn through the blood, and traverses first the placenta and the umbilical cord, then the umbilical vein, then either the liver or the ductus venosus, then the heart, and so is distributed to the whole organism. It is no matter for wonder, therefore, that the primary pathological changes are commonly found in the placenta, liver, or heart. In this way it is quite easy to understand how in such a case as that reported by Bidone erysipelas in the mother does not produce skin lesions in the foetus but streptococcic endocarditis". Again[10] "there is abundant evidence that the placenta does not always succeed in playing its beneficial role (i.e. a filter); in some way or other the barriers are broken down, and germs, toxins, toxic substances, and sometimes anti-toxins, agglutinins, and haemolysins flow across into the foetus. When this happens various effects may be produced: the foetus may die at once from the action of the poison; it may develop the disease in a form different from what is found in the mother, the difference being probably

largely due to the peculiarities of the ante-natal environment and to the special physiological mode of action of the foetal organs; the pregnancy may be brought to an end in abortion, probably caused in most cases by the evil effects the poison has on the decidual membranes rather than by any direct influence on the early foetus; or at later stages in pregnancy the gestation may be brought to a close prematurely and the infant develop the disease after birth and die from it or recover from it."

Ballantyne also believes[11] that an abnormal placenta may be the cause of malformations and deformities, which, when they are not such as to cause death of the foetus, may be fatal to the infant, such as harelip and cleft palate, which in the foetus do not interfere with its nutrition, but which, by rendering the child unable to suck properly, may be the indirect cause of death. Congenital heart disease and foetal ichthyosis are further examples of pathological conditions which do not prove fatal until the specially affected part, i.e. heart or skin, is called upon to face the requirements of a new environment and prove themselves unequal to the task. In all probability the majority of monstrosities and malformations are caused by morbid agents before the

formation of the placenta during what is called the embryonic period, i.e. before the third month[12].

The natural conclusion from the foregoing is that one of the great essentials for the well-being of the infant is "the presence of a healthy and functionally active placenta".

The next thing is to find out, so far as present knowledge permits, what are the factors which cause placental disease. It must be remembered that the study of ante-natal pathology is still in its infancy, but interest has been awakened in it within the past ten years, and each year will probably add its quota of new scientific observations which will help to dispel the ignorance. The following paragraph, quoting again from Ballantyne, sums up most that is known at present[13]: "Prominent among the causes which tend to produce lesions of the placenta are syphilis, renal disease, lead poisoning, fevers, and high temperatures from any cause, heart disease, traumatism (especially blows on the abdomen), violent emotional disturbance, and last but least, alcoholism."

Syphilis. Of Syphilis Fournier writes[14]: "La syphilis est essentiellement meurtrière pour la jeune âge, elle fait de véritables hécatombs d'enfants; elle les tue avant la naissance, au moment de la

naissance, après la naissance dans les premières semaines ou pendant les premières années. Mais ce qu'il y a le plus à redouter ce sont l'avortement syphilitique et la poly mortalité infantile." Anyone who has much experience in midwifery and diseases of children will readily endorse the above statement.

Alcohol. The investigations of Dr Sullivan are of special interest with regard to the effect of chronic alcoholism on the infantile death rate[15]. His enquiry concerned itself with the reproductive history of 120 chronic female inebriates; their offspring numbered 600 and of these 335 or over 50 per cent were either still-born or died under two years of age. He compared the history of a certain number of sober mothers with that of drunken ones belonging to the same families, with the following result.

	Number of Mothers	Number of Children	Number of Children dead under 2 years	Per cent. of dead Children
Sober Mothers	28	138	33	23.9
Drunken Mothers	21	125	69	55.2

Whilst in syphilis the paternal factor is as potent if not more so than the maternal, in alcoholism

it is the sobriety or drunkenness of the mother which counts. Sullivan says the sobriety or reverse of the father is an almost negligible quantity; but then his part is more difficult to prove, so conclusions must not be drawn too rashly.

It is unnecessary to discuss the other causes named by Ballantyne, with the exception of plumbism which will be referred to later.

This part of the subject cannot be left without referring to another factor which there is little doubt plays an important part at the present in ante-natal pathological conditions, but about which it is extremely difficult to get any definite information, i.e. means taken to prevent conception and produced abortions and premature labours. Where sexual intercourse takes place under abnormal and unphysiological conditions, the effects are also abnormal and unphysiological; the resulting congestion of the reproductive organs may go on to inflammation which may be of a more or less chronic nature; if at some ensuing period the special preventative measure fails and conception takes place, the fertilised ovum rests on an unhealthy endometrium and the ante-natal life of the foetus is pathological. What has been said will apply also to the custom of

habitually producing abortions either by drugs or by mechanical means. In Sheffield the habit of taking lead as an abortifacient is well known. Last year three registered midwives were accused of selling pills to pregnant women containing an excessive amount of lead: two were convicted. The writer also knows that this habit has been introduced into Aberdeen by women, chiefly from Hull, who have gone there in connection with the trawling trade.

In one of the other Yorkshire towns a woman told one of the Inspectors that whenever she had any reason to suppose herself pregnant she introduced a bone crochet needle into the womb.

These immoral practices do not only lower the birth rate, but also tend to raise the infantile death rate from ante-natal causes.

Generally speaking the healthy condition of the mother must react on the unborn child. Ballantyne speaking out of his own large experience states that physicians of Maternity Hospitals take it as a fact that if premature labour has to be induced, not because of disease but in order to get the infant through contracted maternal birth canals, its chance of surviving is much greater than if born prematurely of a diseased mother, that in the latter case the

child is notoriously difficult to save even with all the most modern aids of incubation, skilled wet-nurses, and chemically corrected cow's milk.

The effect of the general nutrition of the mother on her offspring is a much debated point. From the scientific side there are the almost classical experiments of Professor Noel Paton on pregnant guinea pigs. The guinea pigs were all kept under the same conditions, except that a certain number were well fed, while the others were kept on a low diet. It was found that whereas the young of the former weighed .35 gram for each gram of the mother's weight, the latter only weighed .24 gram. Professor Paton[16] goes on to say that "in badly nourished mothers each gram would produce a greater proportionate weight of young than in well nourished mothers, if the hypothesis were correct that the foetus is nourished at the expense of the mother, and that underfed mothers produce average weight infants." From the practical side Hirst says[17] "I delivered in consultation a primipara with the utmost difficulty of a child weighing 11¾ pounds. Her physician had advised her to drink two quarts of milk a day between meals throughout pregnancy. She was easily delivered a second time of a child weighing

7½ lbs. after a regulated diet in pregnancy.

The subject of women-labour and its relation to infantile mortality is at present under investigation; the matter is so far-reaching, so many side issues must be considered, that to arrive at any definite conclusion is most difficult. The Home Office has organised a special inquiry to be made in the various large towns during the present year, and till the results of this is forthcoming it may be well to refrain from giving any opinion more definite than the following. Dr Moore in his very able Report on Infantile Mortality says(18)"Work, even hard work, very seldom causes premature labour, but in an ill-fed woman, working and living under indifferent hygienic conditions, it exercises quite an appreciable effect."

The second great division of causes is less debatable ground. Among the systemic diseases those of the alimentary and of the respiratory systems are the most common and the most fatal.

Diseases of the Alimentary System. The great factor causing deaths from gastritis and enteritis is wrong feeding. So much has been written and said on this that it suffices to mention it.

A few words might also be said here about epidemic diarrhoea instead of taking it under infectious diseases as it could be. Given the two conditions of a densely populated city or town and a hot summer, this disease often raises the infantile death rate during the third quarter of the year to an appallingly high figure.

Dr Niven[19] who has made a most exhaustive and scientific inquiry into the causes of this disease believes that the house-fly plays a very important part in its dissemination. If his views are confirmed by other observers the outlook is cheering; once the cause is known the remedy should be only a question of time.

An outbreak of epidemic diarrhoea occurring, as it usually does, in the later summer or early autumn months, kills off most of the weaklings; and one believes it would be found that the death rate of the fourth quarter would not be so high as in a cold year. In 1907 there was little epidemic diarrhoea; the weaklings were not put to the test till the later months when cold and fog kill many from bronchitis and pneumonia. For example, the Infantile Mortality figure for Huddersfield for the third quarter of 1907

was 62, whilst that for the fourth was 131, and of these 21 per cent were due to diseases of the respiratory system.

Table of Deaths due to Diseases of the Alimentary System and of the Respiratory System in the six Yorkshire towns in 1906.

	Alimentary System	Respiratory System
Huddersfield	75 or 24 per cent	46 or 11 per cent
Bradford	177 or 18 " "	99 or 11 " "
Halifax	27 or 11 " "	40 or 16 " "
Brighouse	8 or 12 " "	9 or 14 " "
Leeds	440 or 24 " "	243 or 13 " "
Sheffield	677 or 32 " "	264 or 12 " "

Deaths from diseases of the Urinary, Nervous, Circulatory, Haemopoietic and Integumentary Systems during the first year of life are mostly due to antenatal causes.

Of Infectious Diseases Measles and Whooping Cough with their sequelae are the most fatal. The ordinary working-class mother regards these diseases as ordinary and insignificant details in the life of

a child. Medical advice is often not sought till too late, or when complications have arisen often due to carelessness or ignorance.

Table of Deaths due to Infectious Diseases in the six Yorkshire towns in 1906 - including Tubercle and Syphilis.

Huddersfield	43	or 13.8	per cent
Bradford	81	or 9	" "
Halifax	28	or 11	" "
Brighouse	13	or 20	" "
Leeds	238	or 18	" "
Sheffield	143	or 6.9	" "

The last cause is Traumatism, of which the two commonest forms are overlaying and burning.

PREVENTIVE MEASURES.

In his Report on Infantile Mortality Dr Moore says[21]: "In analysing the causes of Infantile Mortality, one may divide them into three classes, according as they are considered preventable, non-preventable, or doubtfully preventable. It is practically impossible, however, in certain cases to decide whether a given disease or cause of death should be relegated, absolutely, to one or other of these divisions. As classified in the official returns of the Registrar-General, they appear to fall into the three divisions as follows :-

Preventable:

Diarrhoea
Inflammation of the Bowels
Tabes Mesenterica
Accident
Negligence, and the
Notifiable and other Infectious Diseases.

Non-preventable:

Premature Birth
Non-inflation of Lungs, and
Congenital Defects

Doubtfully Preventable:

Debility
Wasting

Inanition
Convulsions
Bronchitis
Inflammation of the Lungs
Inflammation of the Brain and Membranes."

Table of Deaths for the six Yorkshire towns in 1906 according to this Classification.

	Preventable	Non-Preventable	Doubtfully Preventable
Huddersfield	110	51	150
Bradford	258	142	503
Halifax	46	82	114
Brighouse	20	17	28
Leeds	746	435	647
Sheffield	837	566	712
or in per centages			
Huddersfield	35.4	16.6	48.
Bradford	28	17	55
Halifax	14	39	47
Brighouse	31	26	43
Leeds	40.8	23.8	35.4
Sheffield	39	20.4	33.6

For this generation all that can be done directly is to get the number of deaths under Classes I. and III. as near zero as possible, but looking further ahead to the generations yet unborn, deaths from ante-natal causes should be regarded as to a great extent preventable and all means possible taken to achieve this result.

The remedies may be divided for convenience into three great groups :-

Educational,
Public Health, and
Legal Measures.

EDUCATIONAL.

Health Visitors. The appointment of Health Visitors to visit the homes of the working class mother to help and teach her as much as possible about the care of the baby, and her own personal health and hygiene, must have a beneficial effect. The Head of this Department should be, where possible, a Medical Woman working under the Medical Officer of Health and should be chosen not so much for her professional as for her personal qualifications for the post. To quote Dr Moore once more(22): "It is of the greatest importance that such women should have insight and tact, so that they would not only

refrain from giving offence in their very difficult and delicate duties, but they would actually by their sympathetic and tactful bearing gain the regard, the confidence, and even the friendship of the parents whom it is especially sought to influence by their ministrations."

The qualified Medical Woman, particularly if she has been in general practice, will make fewer mistakes, more especially with regard to two classes of the community, whom, if the work is to be a success, she must work with and not against, i.e. the family doctor, and the untrained but registered midwife. The former she will treat as she would have expected him to treat her if their positions had been reversed. The latter should be taught to regard the visitor as a friend, ready to advise and help in any difficulty, and in return the nurse can do much by encouraging the mothers to follow the advice given, and her support is an important factor not to be neglected. The work of the Health Visitor is mainly to see that the baby is being properly fed and looked after; to encourage the mothers to breast feed, or if this is impossible to see that the artificial feeding is being properly done; to discourage bad habits and popular superstitions. If

her duties also include the supervision of the mid-wives in her district, she may help the baby to possess that most valuable asset, a healthy mother, by seeing that she is properly attended to during child-birth.

School Officers. The School Medical Officers appointed under the Act for the Medical Inspection of School Children in England might give short talks to the elder girls and boys on Hygiene and Personal Health, and to the former on the care of children. If it were possible, surprise talks, arranged with the teacher but apparently unexpected, lasting say ten to fifteen minutes, might be given a trial. The children pleased at the unusual interruption would have their attention and memory stimulated, whilst the speaker would only require to bring before them the big essentials; many of the officers would be neither born nor trained teachers and would not be capable of keeping the children interested during a lecture lasting thirty to forty minutes, but could manage to do so for the shorter time.

If there is a proper person available, a course of lectures with practical demonstrations, such as is given by Miss Grace Taylor at Manchester, would be excellent. Miss Taylor says(23): "The girls

attend very well, as the whole subject is so different to their other lessons. If, as happens occasionally, I get a class of girls who have had the lessons before, I am always surprised to find how much they remember of the last course. The lessons are informal talks rather than lectures, and everything that can be shown is shown. I think that anyone who gives such lessons if not a doctor should be a trained nurse, and should have had some practical experience in the care of young children in health and illness. If her knowledge is only theoretical, she will find herself very much puzzled as to how to answer some of the unexpected questions which are asked."

Talks with Men and Women. It is not sufficient to educate the boys and girls; an attempt should be made to reach the younger men and women. During the last few years so much has been said of the duties of motherhood, it would surely only be just that men should be made to realise that fatherhood also has its responsibilities. The fathers as well as the mothers are responsible for the fall in the birth-rate; it has been shown earlier in this paper that the causes which tend to lower the birth rate also help to raise the infantile death rate. Again

if an increasing family demands increased unselfishness, forethought and industry on the part of the mother, no less should it demand likewise from the father. A woman cannot feed and clothe three children for the same money as one, yet one constantly finds a woman receiving the same weekly sum to supply the necessaries of life for herself, her husband and several children as she was given when first married, while the man reserves the same money for his own private use, often one-fifth of the total income, out of which sometimes he clothes himself. Talks at Clubs, Adult Schools, Mothers' Meetings should all be taken advantage of and everything possible done to raise the tone of public opinion on these social matters.

PUBLIC HEALTH MEASURES.

To name some of the most important of these will be sufficient. Proper Housing, good Milk and Water Supply, up-to-date Sanitation, Isolation of Infectious Diseases - all these have an important bearing direct and indirect on the lowering of the Infantile Death-rate.

LEGAL MEASURES.

The Early Notification of Births Act and the Midwives Act - through these much may be done. It is to be hoped that the Children's Act at present under consideration may soon be passed.

But more might still be done with regard to :-

Alcoholism: Power to send inebriate women to suitable homes and to detain them there, thus preventing their begetting children while physically unfit; the same practically applies to the mentally deficient woman.

Factory Acts: An increase in the number of Women Inspectors to ensure that the present laws should be better carried out; more especially that women should not be permitted to return too soon after child birth.

Legal Minimum Wage: A man should be able to earn a sufficient wage to give his wife and family the necessities of life.

Poor Law: There should be means by which a healthy man could be compelled to work in order to feed his family. One of the most difficult cases at present with which the Health Visitor has to deal is the family underfed, scantily clothed, badly housed, because the father will not work, or will not

stick at a job when he gets it. To feed the mother and children means encouragement of the laziness of the father, and not to feed them entails the visiting of the sins of the father unto the third and fourth generation.

S U M M A R Y.

1. The study of preventive measures against excessive Infantile Mortality in six Yorkshire towns.

2. A consideration of the chief causes of Infantile Mortality under the two classes, Ante-natal and Post-natal, the first class including Syphilis, Alcohol, Abortions, and general condition of the Mother; the second Systemic Diseases, notably those of the Alimentary Tract, Infectious Diseases and Traumatism.

3. The best remedial measures, classified under Educational - including Health Visitors, School Lectures, Instruction on Personal Hygiene at Adult Schools, Clubs, Mothers' Meetings, &c. - Public Health and Legal Measures.

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